

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re **PATENT** application of:

Applicant: Ying-Chien Lin

Application No.: 10/772,650

For: METHOD FOR BALANCING THE LOAD OF A WIRELESS LOCAL
AREA NETWORK

Filing Date: February 4, 2004

Examiner: Eugene Yun

Art Unit: 2618

APPEAL BRIEF

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Applicants submit this brief in connection with the appeal of the above-identified case.

I. Real Party in Interest (37 C.F.R. § 41.37(c)(1)(i))

The real party in interest in the present appeal is Infineon Technologies Taiwan Co., Ltd.

II. Related Appeals and Interferences (37 C.F.R. § 41.37(c)(1)(ii))

Appellant, appellant's legal representatives, and/or the assignee of the present application are unaware of any appeals or interferences which will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims (37 C.F.R. § 41.37(c)(1)(iii))

Claims 1-9 are pending in the application. The rejection of claims 1-9 is appealed.

IV. Status of Amendments (37 C.F.R. § 41.37(c)(1)(iv))

No claim amendments were made after the Final Office Action dated April 11, 2008.

V. Summary of Claimed Subject Matter (37 C.F.R. § 41.37(c)(1)(v))

According to the invention of independent claim 1 and referring generally to Fig. 2, a method for balancing the load of a wireless local area network is provided. The method uses the load of the access points as the basis for deciding whether or not to construct an association. (*See, e.g.*, page 7, lines 24-26). The wireless local area network 60 comprises a plurality of access points 62, 64, 66. (*See, e.g.*, Fig. 2, page 2, lines 25-29; page 5, lines 2-6). The method comprises sending a probe-request frame (page 7, lines 14-16) from a station 72 to the plurality of access points 62, 64, 66. (Fig. 2). The method further comprises selecting an access point (*e.g.*, 64) from the plurality of access points 62, 64, 66 that has the lowest load. (*See, e.g.*, page 2, lines 29-30). The access point with the lowest load then sends a probe-response frame to the station 72. (*See, e.g.*, page 2, line 30 – page 3, line 1; page 7, lines 16-18). An association is then constructed between the station 72 and the access point with the lowest load (*e.g.*, 64) to balance the load of the plurality of access points 62, 64, 66. (*See, e.g.*, page 3, lines 1-3; page 7, lines 18-23).

Further, in accordance with the invention of claim 2, the selection of an access point with the lowest load comprises selecting an access point as the master access point, and assigning the other access points as slave access points. (*See, e.g.*, page 3, lines 16-18; page 5, lines 9-12; page 5, lines 13-26). A load collection packet is sent from the master access point to the slave access points. (*See, e.g.*, Fig. 5; page 3, lines 3-5; page 5, line 31 – page 6, line 1). The slave access points then return load index packets that contain load information. (*See, e.g.*, Fig. 5; page 3, lines 5-6; page

6, lines 1-4; page 6, lines 16-17). A load comparison procedure is then performed to select an access point with the lowest load according to the load index packets that have the load information. (See, e.g., Fig. 5; page 3, lines 6-10; page 6, lines 4-5).

In addition, in accordance with the invention of claim 3, the load comparison procedure comprises collecting the load index packets sent from the other access points by each access point. (See, e.g., Fig. 10; page 3, lines 8-9; page 7, lines 6-8). Each access point compares its own load with the loads (from the load information in the load index packets) of the other access points. (See, e.g., Fig. 10; page 3, lines 9-10; page 7, lines 8-9). The access point having the lowest load based on the comparison then turns on a probe-response function, and the other access points turn off their respective probe-response function. (See, e.g., Fig. 10; page 3, lines 10-12; page 7, lines 9-13).

The invention of claim 4 recites that the access point that is selected as the master access point is that access point that is booted first. (See, e.g., page 3, lines 16-17; page 5, lines 11-12).

In accordance with the invention of claim 8, the access point with the lowest load replies a probe-response frame to the station, while the other access points (those without the lowest load), do not reply. (See, e.g., page 3, lines 12-15; page 7, lines 9-14).

In accordance with the invention of claim 9, a wireless local area network system 60 comprises a plurality of access points 62, 64, 66 forming a service set. (See, e.g., Fig. 2; page 2, lines 25-29; page 5, lines 2-6). The system further comprises at least one station 72 configured to send to the plurality of access points a probe-request frame for association with the service set. (See, e.g., page 7, lines 14-16). The system 60 is further configured to select the access point from the plurality of access points that has the lowest load (see, e.g., page 2, lines 29-30), and send a probe-response from the access point with the lowest load to the station. (See, e.g., page 2, line 30 – page 3, line 1; page 7, lines 16-18). The system is still further configured to construct an association between the station 72 and the access point having the lowest load. (See, e.g., page 3, lines 1-3; page 7, lines 18-23).

VI. Grounds of Rejection to be Reviewed on Appeal (37 C.F.R. § 41.37(c)(1)(vi))

Claims 1-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,842,460 (Olkkonen) in view of U.S. Patent No. 6,671,259 (He et al.).

VII. Argument (37 C.F.R. § 41.37(c)(1)(vii))

A. REJECTION OF CLAIMS 1-9 UNDER 35 U.S.C. § 103(a)

Claim 1-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,842,460 (Olkkonen et al.) in view of U.S. Patent No. 6,671,259 (He et al.). Withdrawal of the rejection is respectfully requested for at least the following reason.

i. He et al. do not send a probe-response frame from the access point with the lowest load to the station, as recited in claims 1 and 9.

Claim 1 is directed to a method for balancing the load of a wireless local area network comprising a plurality of access points. The method comprises selecting an access point with the lowest load, and then sending a probe-response frame **from the selected access point with the lowest load to the station** that sent a probe-request frame to the access points. The combination of Olkkonen et al. and He et al. does not teach this feature.

As conceded in the Office Action, Olkkonen et al. do not teach sending a probe-response frame from the access point with the lowest load to the station as claimed. (See O.A., 4/11/08, p. 2, section 2, paragraph 5). However, the Office Action asserts that He et al. do teach this feature, citing to Col. 4, lines 46-49 of the reference. (See O.A., 4/11/08, p. 3, paragraph 2). As will be more fully appreciated below, He et al. do not teach this feature, and thus the combination of Olkkonen et al. and He et al. do not render obvious the invention of claim 1.

He et al. disclose a load balancing system, as illustrated in Fig. 1, that includes multiple client systems 11a-11n, a load balancing server (LBS) selector 15, load

balancing (LB) servers 17a, b, and a plurality of servers 18a-18n, 19a-19m. (See Fig. 1, Col. 3, lines 1-17).

In He et al., a request is made and sent by the client system, wherein the request may be a request for a server on the network to perform a specific task. (See, e.g., Col. 3, lines 55-58). The load balancing (LB) server 17 receives the request *via* the LBS selector 15, and then selects one of the servers to receive the client request. (See, e.g., Col. 4, lines 1-3). The LB server selects a particular server so as to balance tasks among the group of servers. (See, e.g., Col. 4, lines 5-9). To that end, the LB server 17 characterizes each of the available servers based on network load measurements. (See, e.g., Col. 4, lines 25-27). Therefore the available servers are ranked by the LB server 17 in order from low network traffic server to high network traffic server. (See, e.g., Col. 4, lines 39-41). Subsequently, ***the LB server receives the client request from the LBS selector 15, and then selects the server 18a-18n to handle the client request.*** (See, e.g., Col. 4, lines 46-49).

It is unclear from the teaching of He et al. that any probe-response frame is sent back ***from the access point (a server) with the lowest load*** back to the station as claimed. Rather, the LB server 17 simply characterizes the servers based on network load measurements, and then selects one as needed. ***The only information provided by the servers (access points) is the network load information provided to the LB server, which is not a station according to the Office Action.*** If the information sent back to the client 11 is considered a probe-response frame, such probe-response frame is sent from the LB server 17 back to the client system 11, ***and does not come from any of the servers 18.*** Therefore He et al. do not teach sending a probe-response ***from the access point (server)*** to the station (client) as recited in claim 1. Therefore the combination of Olkkonen et al. and He et al. does not render obvious the invention of claim 1.

A similar argument applies to independent claim 9, wherein the system is configured to send a probe-response from the access point with the lowest load to the station. Accordingly, withdrawal of the rejection of claim 9 is respectfully requested.

- ii. ***He et al. do not teach selecting an access point as a master access point and the other access points as slave access points, as recited in claim 2.***

Claim 2 further recites that selecting an access point with the lowest load comprises, *inter alia*, ***selecting an access point as a master access point***, and assigning other access points as slave access points. He et al. do not teach this feature.

According to the Office Action, the servers 18 in He et al. correspond to the claimed access points. (See O.A., 4/11/08, p. 3, ¶6). However, ***He et al. do not teach that one of the servers 18 in Fig. 1 is selected as a master while the others are selected as slave access points as claimed.*** Rather, as taught in Col. 7 of He et al., the LB server 17 that performs load balancing (element 17a,b in Fig. 1) selects one of the servers 18 for a specified session. (See, e.g., Col. 7, lines 35-48). ***This selection does not make the selected server 18 a master and the other servers a slave as claimed.*** Therefore claim 2 is non-obvious over the cited art for at least this additional reason. Accordingly, withdrawal of the rejection is respectfully requested.

- iii. ***He et al. do not teach or suggest collecting load index packets from the other access points, comparing its own load (for each access point) to other loads, and turning on or off a probe-response function of the respective access points in response, as recited in claim 3.***

Claim 3 recites that a load comparison comprises comparing its own load by each access point with the loads of the other access points, and turning on a probe-response function of the access point with the lowest load, and turning off the probe-response function of the other access points. In other words, ***according to the invention of claim 3, each of the access points receive load index packets from all the other access points.*** Using the load index packets, each access point can compare its load to the loads of the other access points. ***Based on the comparison, the access point with the lowest load turns on his probe-response function, while all the other access points turn off their respective probe-response function.*** He et al. do not teach this feature.

He et al. instead has an LB server 17 that performs network load measurements and ranks the servers as high or low network traffic servers. (See, e.g., Col. 4, lines 25-41). Therefore He et al. do not teach this feature of the access points as claimed. In addition, Olkkonen et al. do not remedy the deficiencies in He et al. Therefore claim 3 is non-obvious over the cited art for at least this additional reason. Accordingly, withdrawal of the rejection is respectfully requested.

iv. Additional claim limitations are not taught by the combination of Olkkonen and He et al.

Claim 4 depends upon claim 2, and further recites that the master access point is the access point booted first. The final Office Action cites to Col. 7, lines 60-66 of He et al. as teaching this feature. However, this portion of the cited reference merely states that C1 client is determined to be connected to server S1 as a low load server, and that during operation, due to the connection S1 will be more heavily loaded and server S2 becomes a low load server relative thereto. **Nothing in He et al. states or implies that a master access point exists, or that the master access point is the one that is booted first.** Therefore the combination of Olkkonen and He et al. do not render the invention of claim 4 obvious. Therefore a reversal of the rejection of claim 4 is respectfully requested.

Claim 8 depends upon claim 1, and recites that the access point with the lowest load replies a probe-response frame to the station, and the other access points do not reply. The combination of the cited art does not teach this feature. The final Office Action asserts that Col. 4, lines 42-49 of He et al. discloses this feature. (See O.A., 4/11/08, p. 5, ¶1). This portion of He et al., however, merely states that an LB server 17 selects the lowest load server 18. **The reference neither teaches nor suggests that the server 18 with the lowest load sends a probe-response frame to the station (the client 11).** Rather, any query appears to come from the LB server 17. Therefore claim 8 is non-obvious over the cited prior art. Accordingly, a reversal of the rejection is respectfully requested.

B. CONCLUSION

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully requested that the rejections of the pending claims be reversed.

For any extra fees or any underpayment of fees for filing of this Brief, the Commissioner is hereby authorized to charge the Deposit Account Number 50-1733, INFAP139US.

Respectfully submitted,
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VIII. Claims Appendix (37 C.F.R. § 41.37(c)(1)(viii))

1. (Previously presented) A method for balancing the load of a wireless local area network, the wireless local area network comprising a plurality of access points forming a service set, the method comprising the steps of:

 sending a probe-request frame for association with said service set from a station to said plurality of access points;

 selecting an access point with the lowest load;

 sending a probe-response frame from the access point with the lowest load to the station; and

 constructing an association between the station and the access point with the lowest load for balancing the load of said plurality of access points.

2. (Original) The method for balancing the load of a wireless local area network of Claim 1, wherein the step of selecting an access point with the lowest load access point includes the substeps of:

 selecting an access point as a master access point and assigning the other access points as slave access points;

 sending a load collection packet from the master access point to the slave access points;

 returning load index packets with load information from the slave access points; and

 performing a load comparison procedure to select an access point with the lowest load according to the load index packets.

3. (Original) The method for balancing the load of a wireless local area network of Claim 2, wherein the load comparison procedure comprises the substeps of:

 collecting the load index packets sent from the other access points by each access point;

comparing its own load by each access point with the loads of the other access points; and

turning on a probe-response function of the access point with the lowest load, and turning off the probe-response function of the other access points.

4. (Original) The method for balancing the load of a wireless local area network of claim 2, wherein the master access point is the access point booted first.

5. (Original) The method for balancing the load of a wireless local area network of Claim 2, further comprising a group of reconstruction procedure for selecting the access point with the lowest load as the master access point.

6. (Original) The method for balancing the load of a wireless local area network of Claim 5, wherein the group reconstruction procedure comprises the substeps of:

sending group reconstruction packets with load information from said plurality of access points;

comparing its own load by each access point with the loads of the other access points; and

setting the access point with the lowest load as the master access point.

7. (Original) The method for balancing the load of a wireless local area network of Claim 1, wherein the plurality of access points have the same basic service set identifier.

8. (Original) The method for balancing the load of a wireless local area network of Claim 1, wherein the access point with the lowest load replies a probe-response frame to the station and the other access points do not reply.

9. (Previously presented) A wireless local area network system comprising:
A plurality of access points forming a service set; and
At least one station configured to send to said plurality of access points a probe-request frame for association with said service set,
Wherein the system is configured to select an access point with the lowest load and to send a probe-response from the access point with the lowest load to said station and wherein the system is further configured to construct an association between the station and the access point with the lowest load.

IX. Evidence Appendix (37 C.F.R. § 41.37(c)(1)(ix))

No additional evidence not already part of the official record is relied upon in the arguments provided herein.

X. Related Proceedings Appendix (37 C.F.R. § 41.37(c)(1)(x))

Not applicable.